## **REMARKS**

The Office Action of September 3, 2004 has been reviewed, and its contents carefully considered.

Claims 1, 2, 4, 17 and 19 to 23 are all the claims pending in the application, prior to this present amendment.

The present amendment adds new claim 24.

In addition, applicants have amended claims 1, 2 and 4 to recite "a thickness of the intermediate layer" to "from 50 to 350  $\mu$ m". This is supported at page 50 of the present specification. Claim 23 also claims this thickness.

Claims 17, 19(17), 20(17), 21(17), 22(17) and 23 have been rejected under the first paragraph of 35 U.S.C.§ 112 as failing to comply with the written description requirement.

The Examiner sets forth two reasons for this rejection. Applicants discuss each reason below.

(a) With respect to claim 17, the Examiner states that the disclosure does not support embodiments in which the intermediate layer "does not contain titanium oxide". The Examiner states while the tables in the specification demonstrate that applicant has envisioned embodiments wherein titanium dioxide was excluded, there is no support in the original disclosure that all titanium oxides may be excluded.

In response, applicants have amended claim 17 to recite that the intermediate layer does not contain a titanium compound. Support for such an amendment appears in the present specification at page 75, lines 16 to 21.

Further, applicants direct the Examiner's attention to the disclosure at page 76, lines 20 to 21, which specifically states that "a titanium compound is not contained in the base layer or intermediate layer." Applicants submit that this disclosure at page 76 provides further support for excluding the titanium compound in either the base layer or the intermediate layer.

(b) With respect to claim 23, the Examiner states that the original disclosure does not provide support for laminates comprising an intermediate layer, wherein the laminate has a light transmittance of 40% or more and a haze value of 60% or less when the total thickness is 3mm. (Applicants note that claim 23 actually refers to a total thickness of 3.3mm.)

The Examiner states that there is no support for the newly claimed end points of 62% or more light transmittance or 8.3% or less haze. The Examiner states that applicants have referred to Example 10, in Table 2 (the Examiner refers, in error to Table 10) to support the amendment. but neither end point is supported by Example 10.

Regarding the thickness of the constituent layers, the base layer has a thickness of 3.0 mm and the intermediate layer has a thickness of 0.3 mm in the present Examples. Accordingly, the thickness of the molding is 3.3 mm. The thickness, 0.4  $\mu$ m or 3  $\mu$ m of the surface layer is neglected.

In Example 14, the base layer is formed of a base formulation B. Base formulation B comprises PVC with 64% chlorination degree + tin-based stabilizer + lubricant + processing aid + reinforcing agent. The intermediate layer is formed of a base formulation B. Base formulation B' comprises PVC with 64% chlorination degree + tin-based stabilizer + lubricant + processing aid + reinforcing agent. The surface layer comprises acrylic resin + tin oxide.

Example 10 differs from Example 14 only in the point of the constitution of the surface

layer.

From these, applicants submit that claim 23 is supported by Examples 10 and 14. In

these Examples, the total light transmittance is 62% and 63%, that is, "62% or more, and the

haze is 8.3% and 8.0%, that is, "8.3% or less".

Accordingly, applicants submit the numerical definition of "62% or more, and 8.3% or

less" in claim 23 is supported by Examples 10 and 14 of the specification.

In view of the above, applicants submit that the claims comply with the written

description requirement and, accordingly, request withdrawal of this rejection.

Claims 1, 2, 17, 20, 21 and 22 have been rejected under 35 U.S.C. § 103(a) as obvious

over JP '230 to Watanabe in view of Yoshizumi.

The Examiner sets forth a detailed discussion of this rejection in Paragraph 9, beginning

at page 4 of the Office Action.

(1) In this rejection, the Examiner now interprets JP '230 in the same manner as

applicants argued in the Amendment Under 37 C.F.R. § 1.116 filed on April 19, 2004. Thus, in

this rejection, the Examiner considers the molded object to correspond to the base layer, and

considers the surface layer to correspond to applicants' claimed intermediate layer.

(2) At page 5 of the Office Action, last paragraph, the Examiner recognizes that the

intermediate layer (surface layer) in JP '230 having a chlorination degree of 50 to 57% does not

satisfy the claimed range of 58 to 73%. The Examiner argues that a prima facie case of

obviousness exists where the claimed ranges and the prior art ranges do not overlap, but are close

enough that one or ordinary skill in the art would have expected them to have the same

properties. The Examiner argues that in the present case, one would have expected a

chlorination degree of 57% as disclosed in JP '230 to have the same properties as an intermediate

layer with a chlorination degree of 58%.

The Examiner does not comment on applicants' argument that JP '230, in effect, teaches

against employing a chlorination degree of 58% for the intermediate (surface) layer.

(3) Alternatively, the Examiner argues that JP '230 teaches that the chlorination

degree of a polymer will affect its fire resistance, thermal stability and moldability and,

therefore, it would have been obvious to optimize the chlorination degree of the intermediate

layer in JP '230.

Again, the Examiner does not comment on applicants' arguments that JP '230 teach

against such an optimization for the intermediate (surface) layer of JP '230.

In response to the above points (1) to (3), applicants' comments on these points are the

same as those given in the Amendment Under 37 C.F.R. § 1.116 filed on April 19, 2004 in

responding to the previous Office Action.

In particular, since the thickness of the constituent layers is defined in the claims, the

base layer and the intermediate layer are clarified. JP '230 is directed to a laminate that

comprises a base layer of PVC having a chlorination degree of from 58 to 73% and having a

thickness of from 2 to 12 mm, and a surface layer of PVC having a chlorination degree of from

50 to 57% and a thickness of from 0.2 to 1.6 mm.

laminate of JP '230 into a laminate that comprises a base layer having a chlorination degree of

In the absence of a specific reason to do so, however, it is impossible to convert the

from 50 to 57% and a thickness of from 2 to 12 mm and a surface layer having a chlorination

degree of from 58 to 73% and a thickness of from 0.2 to 1.6 mm.

JP '230 to Watanabe is a document that has inventors which are common to the present

application, and the applicants well know its technique. In JP '230 to Watanabe, the layer

having a thickness of from 0.2 to 1.6 mm is a surface layer having a chlorination degree of from

50 to 57%.

In addition, applicants set forth the following additional comments on the above items (1)

to (3).

Further, it is to be noted that PVC having a chlorination degree of 57% differs from PVC

having a chlorination degree of 58% in point of their resin properties.

In ordinary reaction, PVC is produced to have a chlorination degree of 56.8%. This is

PVC (U-PVC) ordinarily used in the art. A resin prepared by further chlorinating the ordinary

U-PVC with chlorine gas added thereto is a chlorinated polyvinyl chloride, that is, a polyvinyl

chloride resin (C-PVC) having a chlorination degree of 58% or more.

Accordingly, C-PVC requires one additional step for its production and is, therefore,

expensive, as compared with U-PVC. Further, C-PVC is more rapidly decomposed as its

chlorine content is large, and, in addition, its chemical resistance and processability are not good.

C-PVC is characterized in that its heat-resisting temperature is high. The differences between

the two, U-PVC and C-PVC, are well known by one skilled in the art, and are differentiated in

their practical use. If the expression of U-PVC or C-PVC is not given to PVC products, then the

products may be erroneously used and may cause problems.

To that effect, PVC having a chlorination degree of at most 57% and PVC having a

chlorination degree of at least 58% are different resins that are produced by different methods,

though they may be referred to as the same designation of "polyvinyl chloride". Therefore, even

though 57% PVC is described in JP '230 to Watanabe, it is impossible to directly employ 58%

PVC in place of the 57% PVC.

(4) With respect to the thickness of the intermediate layer in claim 17, the Examiner

takes the position that an about 200  $\mu$ m thickness disclosed in JP '230 anticipates the less than

200  $\mu$ m thickness of the present claims, because the term "about 200  $\mu$ m" is inclusive of

thicknesses that are slightly less than 200  $\mu$ m.

In response, applicants point out that in JP '230 to Watanabe, the paragraph [0041] says

as follows:

The thickness of the surface layer is from 0.2 to 1.6 mm, but the layer having a

thickness of 0.2 mm or less has poor chemical resistance. Preferably, the

thickness of the layer is from 0.4 to 1.1 mm.

This description means that the thickness of 0.2 mm or less is not good, and when a layer

having a thickness of 0.2 mm is employed, then it will need the ground for its employment.

In JP '230 to Watanabe, the surface layer is positioned as the surface of the laminate.

Naturally, therefore, the thickness of the layer may have some influence on the chemical

resistance of the laminate.

In claim 17 of the present invention, the thickness is that of the intermediate layer, and this does not have any direct influence on the chemical resistance of the laminate. Accordingly, the thickness may be 200  $\mu$ m or less.

In JP '230 to Watanabe, the paragraph [0015] describes the base layer. In this, the thickness of the base layer is from 2 to 12 mm, that is, this corresponds to almost all the overall thickness of the molding. Therefore, the chlorination degree of the layer has influences on the flame retardancy, the thermal stability, the moldability and the bending workability of the molding.

In JP '230 to Watanabe, the thickness of the surface layer is only from 0.2 to 1.6 mm, and therefore the surface layer does not have any significant influence like the base layer. In particular, in claim 17 of the present invention, the thickness of the intermediate layer is 200 µm or less, and does not have an influence on the laminate. In other words, the thickness of the intermediate layer is limited to that not having any influence on the laminate.

See also the discussion of "construction (b)" with respect to thickness at pages 10 and 11 of the Amendment Under 37 C.F.R. § 1.111 filed on August 18, 2003.

In addition, applicants have not been able to find in JP '230 the description "about 200  $\mu$ m" to which the Examiner has referred.

(5) With respect to the thickness of the intermediate layer in claim 22, the Examiner argues that JP '230 teaches that the thickness of the intermediate (surface) layer affects the laminates chemical resistance and, therefore, it would have been obvious to vary the thickness.

In response, and as discussed above, applicants point out that in JP '230 to Watanabe, the paragraph [0041] says as follows:

> The thickness of the surface layer is from 0.2 to 1.6 mm, but the layer having a thickness of 0.2 mm or less has poor chemical resistance. Preferably, the thickness of the layer is from 0.4 to 1.1 mm.

This description means that the thickness of 0.2 mm or less is not good, and when a layer having a thickness of 0.2 mm is employed, then it will need the ground for its employment.

In JP '230 to Watanabe, the surface layer is positioned as the surface of the laminate. Naturally, therefore, the thickness of the layer may have some influence on the chemical resistance of the laminate.

In claim 22 of the present invention, the thickness is that of the intermediate layer, and this does not have any direct influence on the chemical resistance of the laminate. Accordingly, the thickness may be 25 to 150  $\mu$ m.

In JP '230 to Watanabe, the paragraph [0015] describes the base layer. In this, the thickness of the base layer is from 2 to 12 mm, that is, this corresponds to almost all the overall thickness of the molding. Therefore, the chlorination degree of the layer has influences on the flame retardancy, the thermal stability, the moldability and the bending workability of the molding.

In JP '230 to Watanabe, the thickness of the surface layer is only from 0.2 to 1.6 mm, and therefore the surface layer does not have any significant influence like the base layer. In particular, in claim 22 of the present invention, the thickness of the intermediate layer is 25 to

150  $\mu$ m, and does not have an influence on the laminate. In other words, the thickness of the intermediate layer is limited to that not having any influence on the laminate.

(6) The Examiner relies on Yoshizumi for a teaching of an antistatic layer.

The Examiner does not comment on applicants' arguments as to why one of ordinary skill in the art would not use the Yoshizumi antistatic layer as an outside surface layer in JP '230.

In response, applicants rely on the same comments as those given in the Amendment Under 37 C.F.R. § 1.116 filed on April 19, 2004 in response to the previous Office Action.

In the present invention, since the thickness of the constituent layers is defined, the base layer and the surface layer (intermediate layer) are clarified. In JP '230 to Watanabe, the surface layer has a chlorination degree of from 50 to 57%, but it is obvious that the chlorination degree of the intermediate layer in claim 22 of the present invention is from 58 to 73%.

Obviously, therefore, the two layers differ from each other in point of their chlorination degree (as mentioned above, those skilled in the art consider that the two resins thus having such a different chlorination degree should be different resins). In addition, in JP '230 to Watanabe, there is shown no technical idea of using a surface layer (intermediate layer) having a chlorination degree of from 58 to 73%.

Moreover, in JP '230 to Watanabe, the description in paragraph [0015] relates to a base layer, as mentioned in item (4) above. In this, therefore, the chlorination degree of the intermediate layer must be discussed separately from this description in paragraph [0015]. The chlorination degree of the surface layer in JP '230 to Watanabe is from 50 to 57 %, and nothing other than it is taught by JP '230 to Watanabe.

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The chlorination degree of the base layer of the present invention arguably could be taught by paragraph [0015] in JP '230 to Watanabe. However, since the intermediate layer in the present invention is thin and does not have any direct influence on the chemical resistance of the laminate, the chlorination degree of the intermediate layer could not be taught by the paragraph [0015] in JP '230 to Watanabe.

In view of the above, applicants submit that JP '230 to Watanabe and Yoshizumi do not render obvious the subject matter of the above claims and, accordingly, request withdrawal of this rejection.

Claims 1, 2, 17, 21 and 22 have been rejected under 35 U.S.C. § 103(a) as obvious over JP '230 in view of Holley.

The Examiner sets forth a detailed statement of this rejection of Paragraph 10, beginning at page 7 of the Office Action.

This rejection is similar to the rejection in Paragraph 9 of the Office Action, except that the Examiner relies on Holley instead of Yoshizumi for teaching of an antistatic layer.

In response, applicants rely on the comments they set forth above in connection with the rejection in Paragraph 9.

Claims 1, 2, 4, 17, 19, 20, 21 and 22 have been rejected under 35 U.S.C. § 103(a) as obvious over JP '945 in view of Yoshizumi.

The Examiner sets forth a detailed statement of this rejection in Paragraph 11, beginning at page 9 of the Office Action.

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(1)

At page 10 of the Office Action, last paragraph, the Examiner recognizes that the

intermediate layer (surface layer) in JP '945 having a chlorination degree of 50 to 57% does not

satisfy the claimed range of 58 to 73%. The Examiner argues that a prima facie case of

obviousness exists where the claimed ranges and the prior art ranges do not overlap, but are close

enough that one or ordinary skill in the art would have expected them to have the same

properties. The Examiner argues that in the present case, one would have expected a

chlorination degree of 57% as disclosed in JP '945 to have the same properties as an intermediate

layer with a chlorination degree of 58%.

The Examiner does not comment on applicants' arguments that JP '945 in effect teaches

against employing a chlorination degree of 58% for the intermediate (surface) layer.

(2) Alternatively, the Examiner argues that JP '945 teaches that the chlorination

degree of a polymer will affect its fire resistance thermal stability and moldability and, therefore,

it would have been obvious to optimize the chlorination degree of the intermediate layer in JP

**'945**.

(3) Again, the Examiner does not comment on applicants' arguments that JP '945

teaches against such an optimization for the surface layer.

(4) The Examiner relies on Yoshizumi for a teaching of an antistatic layer.

The Examiner does not comment on applicants' arguments as to why one of ordinary

skill in the art would not use the Yoshizumi antistatic layer as an outside surface layer in JP '945.

In response to the above points (1) to (4), and as applicants have mentioned above in the

additional comments on items (1) to (3) of applicants' discussion of the Paragraph 9 of the Office

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Action, U-PVC having a chlorination degree of at most 57% differs from C-PVC having a chlorination degree of at least 58 % in point of their production, properties and costs, even though they are referred to as the same designation, polyvinyl chloride. In consideration of their advantages and disadvantages, therefore, those skilled in the art differentiate the two resins in practical use thereof. If anyone says that the two, U-PVC and C-PVC could be readily derived from each other since their numerical data are similar, it is an unreasonable judgment caused by neglecting the above-mentioned differences between the two.

In JP '945 to Watanabe, corresponding to Japanese publication No. 2000-264976A, the surface layer has a chlorination degree of from 50% to less than 58%, but not from 58 to 73%. Accordingly, JP '945 to Watanabe may teach the provision of an antistatic layer on a polyvinyl chloride surface layer (intermediate layer) having a chlorination degree of from 58 to 73%. In JP '945 to Watanabe, the surface layer has a chlorination degree of from 50% to less than 58%, and it improves the chemical resistance and the corrosion resistance of the laminate. See paragraph [0045] thereof. If the chlorination degree of the surface layer is changed to 58% or more, then the chemical resistance and the corrosion resistance of the surface layer are poor and this change will overstep the object of JP '945 to Watanabe. Therefore, the change is not easy for anyone skilled in the art.

Regarding the chlorination degree of PVC, the Examiner says that the chlorination degree of PVC has some influence on the flame retardancy of PVC moldings, as so described in paragraph [0025] of JP '945 to Watanabe. However, the description in paragraph [0025] relates to a base layer, and not to the chlorination degree of polyvinyl chloride for a surface layer. Since

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the base layer accounts for almost all of the moldings, its chlorination degree has great influences on the flame retardancy of the moldings. However, since the surface layer is thin, it does not have any great influence on the flame retardancy of the moldings, unlike the base layer in JP **'945**.

Accordingly, if the description relating to the base layer is applied to a surface layer, then some background to support it will be necessary, but in JP '945, there is given no description that teaches the background.

With regard to Yoshizumi, applicants rely on their comments set forth in the Amendment Under 37 C.F.R. § 1.116 filed on April 19, 2004.

(5) Further, with respect to claim 19, the Examiner argues that it would have been obvious to employ, as a binder in the antistatic layer of Yoshizumi, a vinyl chloride polymer having a controlled vinyl chloride content, in view of the teachings of JP '945 to Watanabe that the chlorination degree of a polymer will affect its fire resistance, thermal stability and moldability.

Using PVC having a chlorination degree of from 58 to 73% as a binder resin in the antistatic layer is an entirely different issue from the matter of chlorination degree of the base layer. The antistatic layer is extremely thin, having a thickness of from 0.1 to 1.5  $\mu$ m (0.0001 to 0.0015 mm), and it could not be discussed on the same level as that of the base layer having a thickness of from 2 to 12 mm. Even when the use of PVC having a chlorination degree of from 58 to 73% as a base layer is described, the use of that PVC in an antistatic layer, especially as a

binder resin in the layer, could not be considered if there is no specific reason or motivation to do so.

In general, PVC having a chlorination degree of 56.8% is used as a binder resin, but PVC having a chlorination degree of 58% or more is not used, and therefore it is natural that using that PVC having a such a high chlorination degree of from 58 to 73% would not be taken into consideration.

In view of the above, applicants submit that JP '945 and Yoshizumi do not defeat the patentability of the above claims and, accordingly, request withdrawal of this rejection.

Claims 1, 2, 4, 17, 21 and 22 have been rejected under 35 U.S.C. § 103(a) as obvious over JP '945 in view of Holley.

The Examiner sets forth a detailed statement of this rejection in Paragraph 12, beginning at page 11 of the Office Action.

This rejection is generally similar to the rejection in Paragraph 11 above, except that the Examiner now relies on Holley as a secondary reference for showing an antistatic layer instead of Yoshizumi.

In response, applicants rely on the same arguments set forth in the Amendment Under 37 C.F.R. § 1.116 filed on April 19, 2004, and rely on the same arguments that applicants employ above in response to the rejection in Paragraph 11 above.

Claims 1, 2, 19, 20 and 21 have been rejected under JP '520 in view of Yoshizumi.

The Examiner sets forth a detailed statement of this rejection in Paragraph 13, beginning at page 13 of the Office Action.

In response, applicants point out that JP '520 to Watanabe discloses single-layered or laminate-layered moldings (A1 to A7, B1 to B6, C, D1 to D7). Of those, A1 to A5, B1 to B4, C and D1 to D3 are single-layered moldings, and they do not teach the laminates of the present invention.

Of the laminate-structured moldings in JP '520 to Watanabe, three of them, namely, A7, D5 and D7, teach the use of PVC having a chlorination degree of from 58 to 73% as the intermediate layer and the use of PVC having a chlorination degree of 58 to 73% as the surface layer. The moldings in which the intermediate layer is formed of PVC having a chlorination degree of 58% or less are A6, B5 and B6 for which PVC is used, and D4 and D6 for which 56% PVC is used.

The present claims are individually compared with the claims in JP '520.

i) Re: Claim 1:

In JP '520 to Watanabe, the moldings in which the base layer contains titanium oxide are two, B5 and B6. Regarding these, however, there is given no description saying that PVC of the surface layer of the moldings has a chlorination degree of from 58 to 73%, and there is given no description to teach it.

In A7, D5 and D7 in which PVC of the surface layer has a chlorination degree of from 58 to 73%, the surface layer does not contain titanium oxide, and there is given no description to teach the use of titanium oxide in the surface layer.

In JP '520 to Watanabe, the thickness of the surface layer is 0.4 mm or more (e.g., in paragraph [0106], [0153], [0157]), and there is given no description saying that the thickness is

from 50 to 350  $\mu$ m. If the thickness of the intermediate layer is too large, then the antistatic layer to be formed thereon will be difficult to form on it, and, in addition, when the laminate is wound up, it may readily have a wound habit and will be difficult to handle. Still another disadvantage of the case is that layer lamination will be difficult. In addition, the cost of moldings will be high.

ii) Re: Claim 2:

In JP '520 to Watanabe, both the base layer and the surface layer are formed of PVC having a chlorination degree of from 58 to 73% in D5 and D7. However, the thickness of the intermediate layer is not described therein.

With reference to the other laminates in JP '520 to Watanabe, the surface layer has a thickness of 0.4 mm or more (e.g., paragraphs [0106], [0153], [0157]), and there is given no description to say the thickness is from 50 to 350  $\mu$ m.

iii) Re: Claim 9:

In Yoshizumi, antimony-containing tin oxide is dissolved in a binder resin and applied to the base layer, and acrylic polymer, polyvinyl chloride and polycarbonate are mentioned for the binder resin. In this, use of polyvinyl chloride resin is described, but there is given no description relating to the use of polyvinyl chloride resin having a chlorination degree of from 58 to 73%.

Anyone skilled in the art that has known the description of polyvinyl chloride resin naturally considers that the resin is an ordinary polyvinyl chloride resin having a chlorination degree of 56.8%. Polyvinyl chloride resin having a chlorination degree of 58% or more differs

from the ordinary polyvinyl chloride resin, as mentioned above in the discussion of the rejection of Paragraph 9 of the Office Action.

Therefore, if there is not any specific requirement (e.g., heat-resisting temperature) for the resins to be used, the PVA resin having such a high chlorination degree of 58% or more is not taken into consideration in view of the use results and the costs thereof. Accordingly, from the description of Yoshizumi, it is not easy to derive the use of polyvinyl chloride resin having a chlorination degree of from 58 to 73% as a binder resin.

iv) Re: Claim 20:

In Yoshizumi, epoxy resin is described for a binder resin, but there is given no description relating to the use of thermosetting resin as a binder resin.

v) Re: Claim 21:

In Yoshizumi, tin oxide is described as a conductive material. Applicants admit that this is the same as in the present invention. However, claim 21 is dependent from claims 1, 2, 4, 16, 17 and 18, and the present invention differs from Yoshizumi in point of these claims.

Further, in Yoshizumi, there is given no description relating to long carbon fibers, as now recited in new claim 24.

In view of the above, applicants submit that claims 1, 2, 19, 20, 21 and new claim 24 are patentable over JP '520 in view of Yoshizumi and, accordingly, request withdrawal of this rejection.

Claims 1, 2, 20 and 21 have been rejected under 35 U.S.C. § 103(a) as obvious over JP '520 in view of Holley.

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The Examiner sets forth a detailed statement of this rejection in Paragraph 14, beginning

at page 15 of the Office Action.

This rejection is essentially the same as the rejection in Paragraph 13 above, except that

the Examiner relies on Holley as a secondary reference for teaching an antistatic layer. In

response, applicants rely on the same arguments that applicants employ with respect to the

rejection in Paragraph 13 above.

In view of the above, reconsideration and allowance of this application are now believed

to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is

kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue

Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any

overpayments to said Deposit Account.

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Date: December 3, 2004